

WHAT IS CLAIMED IS:

1. A blood pressure measuring apparatus comprising:
oppressing means for oppressing blood vessels of a human
body;

oppressing pressure detecting means for detecting the
oppressing pressure value on the blood vessels by the oppressing
means;

similar waveform detecting means for detecting similar
waveforms changing similarly to pressure changes in the blood
vessels oppressed by the oppressing means in one heartbeat period;
and

blood pressure calculating means for determining the scale
of the similar waveforms detected by the similar waveform
detecting means, and calculating the blood pressure by matching
the determined scale of similar waveforms with the scale of
waveforms showing pressure changes in the blood vessels, wherein

the blood pressure calculating means includes:

level detecting means for detecting the level of the similar
waveforms in one heartbeat period; and

means for determining the scale of the similar waveforms
on the basis of the similarity ratio indicated by the ratio of
the difference of levels at two moments of maximum level and
minimum level detected by the level detecting means and the
difference of the oppressing pressure values detected by the
oppressing pressure detecting means corresponding to the two

moments, and matching the determined scale of similar waveforms with the scale of the waveforms showing pressure changes in the blood vessels.

2. The blood pressure measuring apparatus according to claim 1, wherein

the two moments correspond to the starting moments of closure of the blood vessels by the two different oppressing pressure values to the blood vessels by the oppressing means.

3. The blood pressure measuring apparatus according to claim 1, wherein

the similar waveforms are waveforms of pulse waves derived from pulsation components of volume changes of the blood vessels caused by oppression by the oppressing means.

4. The blood pressure measuring apparatus according to claim 1, wherein

the blood pressure calculating means includes systolic pressure calculating means for calculating the oppressing pressure value corresponding to the maximum level as the systolic pressure, on the basis of the difference between the maximum level detected by the level detecting means and one level of the levels at two moments detected by the level detecting means, the oppressing pressure value detected by the oppressing pressure detecting means corresponding to the moment of the one level, and the similarity ratio.

5. The blood pressure measuring apparatus according to

claim 1, wherein

the blood pressure calculating means includes diastolic pressure calculating means for calculating the oppressing pressure value corresponding to the minimum level as the diastolic pressure, on the basis of the difference between the minimum level detected by the level detecting means and one level of the levels at two moments detected by the level detecting means, the oppressing pressure value detected by the oppressing pressure detecting means corresponding to the moment of the one level, and the similarity ratio.

6. A blood pressure measuring apparatus comprising:

oppressing means for oppressing blood vessels of a human body;

similar waveform detecting means for detecting similar waveforms changing similarly to pressure changes in the blood vessels oppressed by the oppressing means in one heartbeat period; and

blood pressure calculating means for determining the scale of the similar waveforms detected by the similar waveform detecting means, and calculating the blood pressure by matching the determined scale of similar waveforms with the scale of waveforms showing pressure changes in the blood vessels, wherein

the similar waveform detecting means includes pulse wave detecting means for detecting the waveform of pulse waves derived from pulsation components of volume changes of the blood pressure

caused by oppression by the oppressing means as the similar waveforms, and

the blood pressure calculating means includes:

storing means for storing, in the one heartbeat period, the levels of waveforms of first, second and third pulse waves detected by the pulse wave detecting means by first oppressing pressure not closing the blood vessels by the oppressing means, and second oppressing pressure and third oppressing pressure for closing the blood vessels;

level specifying means for specifying the second and third level corresponding to the starting moments of closure of the waveforms of the second and third pulse waves, of the waveform of the first pulse wave matched in time phase with the waveforms of the second and third pulse waves, in the contents stored in the storing means; and

processing means for determining the scale of the similar waveforms on the basis of the difference of the second level and third level specified by the level specifying means, and the similarity ratio indicated by the ratio of the difference of the second oppressing pressure and third oppressing pressure, and matching the determined scale of the similar waves with the scale of the waveform indicating the pressure changes in the blood vessels.

7. The blood pressure measuring apparatus according to claim 6, wherein

the processing means divides a second change amount as change amount of waveform of the first pulse corresponding to the difference between the maximum level of the waveform of the first pulse stored in the storing means and the second level, by a first change amount as change amount of waveform of the first pulse wave corresponding to the difference of the second level and third level, multiplies the obtained amount by the difference of the second oppressing pressure and third oppressing pressure, adds the second oppressing pressure to the product, and calculates the result as the systolic pressure.

8. The blood pressure measuring apparatus according to claim 6, wherein

the processing means divides a second change amount as change amount of waveform of the first pulse corresponding to the difference between the minimum level of the waveform of the first pulse stored in the storing means and the third level, by a first change amount as change amount of waveform of the first pulse wave corresponding to the difference of the second level and third level, multiplies the obtained amount by the difference of the second oppressing pressure and third oppressing pressure, subtracts the product from the third oppressing pressure, and calculates the result as the diastolic pressure.

9. The blood pressure measuring apparatus according to claim 6, wherein

the waveforms of the first, second and third pulse waves

are matched in time phase on the basis of the moment corresponding to the maximum levels of the waveforms stored in the storing means.

10. The blood pressure measuring apparatus according to claim 9, further comprising:

electrocardiographic detecting means for detecting electrocardiographic signals from a person to be measured simultaneously with measurement of blood pressures, wherein the waveforms of the first, second and third pulse waves are matched in time phase on the basis of the characteristic waveforms in the electrocardiographic signals detected by the electrocardiographic detecting means in the one heartbeat period.

11. The blood pressure measuring apparatus according to claim 10, wherein

the characteristic waveforms show the peak of R waves.

12. The blood pressure measuring apparatus according to claim 1 or 6, wherein

the blood pressure calculating means includes pulse pressure calculating means for calculating the pulse pressure.

13. The blood pressure measuring apparatus according to claim 12, wherein

the pulse pressure calculating means calculates the pulse pressure on the basis of the difference of the maximum level and minimum level and the similarity ratio.

14. The blood pressure measuring apparatus according to

claim 2 or 6, wherein

the blood pressure calculating means further includes closure start point detecting means for detecting the start moment of closure of the blood vessels, and

the closure start point detecting means detects the moment of start of closure by selecting the candidate moment showing the maximum difference between the slope level corresponding to the candidate moments of the similar waveforms and the slope level corresponding to the immediately preceding candidate moment, among a plurality of candidate moments from terminal end moment of the one heartbeat period to the moment corresponding to the maximum level.

15. The blood pressure measuring apparatus according to claim 1 or 6, further comprising:

a first measuring unit including the similar wave detecting means and blood pressure calculating means; and

a second measuring unit for measuring the blood pressure according to the oscillometric method while gradually changing the oppression to the blood vessels by the oppressing means, wherein

one of the first and second measuring units is selectively activated.